SUMMARY

Overpopulation of elephants in confined conservation areas is a concern in South Africa. As elephant populations increase, so too does their impact on the vegetation. In May 1994 a successful relocation of 50 elephants from the Kruger National Park (KNP) to Welgevonden Private Game Reserve (WPGR) in the Northern Province, South Africa took place. Impact by the elephants on the vegetation of this reserve has since become a concern. The aims of this study were to quantify this impact by determining whether differences in patterns of vegetation or habitat use existed between bachelor and breeding groups. Data were collected at two ecological scales: the first at the local feeding patch scale and the second at the environmental habitat scale. Data were analysed by comparing resource use between sexes within seasons, and within sexes between seasons. Feeding data collected from 202 food plots were used to test two hypotheses concerning feeding patch utilisation by elephant bull and breeding groups on WPGR. The first hypothesis stated that an elephant population can be divided into two functional groups on the basis of their relative utilisation of the vegetation: a) bachelor groups and b) breeding groups. The second hypothesis tested stated that bachelor groups have a greater impact on the woody vegetation than breeding groups. Both of these hypotheses were rejected for this research in the Waterberg. Results show that elephant bachelor and breeding groups on WPGR exhibit few differences in resource use at the feeding patch level in the dry season. In this season, when resources undoubtedly become limited, no difference in feeding patch use between bachelor groups and breeding groups suggests a lack of inter-sexual competition and hence that the population is currently below carrying capacity. The results also showed that bachelor groups and breeding groups do not differ in the intensity or frequency of impact they have on the woody vegetation. Nevertheless, the continued monitoring of woody species preferred by the group types is imperative. Three habitat types are available to the elephants: plateau, hillslope and valley bottom. Both bachelor and breeding groups preferred valley bottom disproportionately more than habitat availability, in both seasons. Plateau and hillslope were utilised disproportionately less than availability. Habitat availability was calculated

using two methods: using habitat area and using the proportional contribution of roads to habitat area. Preference of valley bottom by both elephant sexes is important for management purposes since this habitat has the smallest surface area in comparison with the other two habitats, and therefore structural modification could be more visible in that habitat. Damage to vegetation will also be more obvious to both landowners and tourists since the highest proportion of roads per habitat area are in the valley bottom. When sexes were compared within seasons, in the dry season, bachelor groups used valley bottom more and breeding groups used hillslope more. One explanation for this differential pattern of habitat utilisation is that the breeding groups may be displaced from preferred valley bottom by disturbance from vehicles in that habitat.